Comparative analyses of Latin American contexts: some findings

Heintz, Peter

COMPARATIVE ANALYSES OF LATIN AMERICAN CONTEXTS

Some Findings

Peter Heintz

I.

We shall compare sets of relationships between variables which refer to different levels of societal units (nations, provinces and departments = provincial subunits). In addition, we shall try to increase the comparability of the contexts by means of subdividing the sample of the Latin American countries and that of the Argentinian provinces each one into two strata defined with reference to the income per capita, with the aim of obtaining higher correlations between some of the major variables.

The most important sample used for comparative purposes is the universe of the Latin American countries with the exception of Venezuela[1)] which has been excluded as an extreme deviant case due to the lead of its income per capita value (see Correlation matrices in the Annex). The Latin American countries are divided in high and low according to their level of income per capita.

The low countries are the following:

---

1) For this reason, the results are only partially comparable with those of the "Paradigma".

Table 1

Country	GNP per capita (I) (1955-59) Prices in Dollars of 1950	Standardized Values (0-100) (without Venezuela)
Bolivia	75	0
Haiti	80	1.1
Paraguay	100	5.3
Ecuador	140	14.9
Guatemala	175	21.1
Honduras	175	21.1
Nicaragua	175	21.1
El Salvador	175	21.1
Peru	175	21.1

The high countries are the following:

Table 2

Dominican Republic	200	26.3
Mexico	200	26.3
Brazil	250	36.8
Costa Rica	250	36.8
Columbia	300	47.4
Chile	325	52.6
Panamá	350	57.9
Cuba	375	63.2
Uruguay	400	68.4
Argentina	550	100.0

The cutting point between high and low countries divides two groups of nations whose correlations between income per capita (Δ I) during 1945-1959 (I) and growth rate of income per capita are very high and have inverted signs.

Table 3

Latin American Countries
with high I

I	ΔI (1945 - 1959) high	ΔI (1945 - 1959) low
high	0	5
low	5	0

Q = -1.0

(The developed countries also show a negative correlation between I and ΔI. See P. Burger's article in Bulletin No. 2 "Development Patterns of Underdeveloped and Developed Countries", pp.1).

Table 4

Latin American Countries
with low I

I	ΔI (1945 - 1959) high	ΔI (1945 - 1959) low
high	3	Guatemala Honduras 2
low	1 Ecuador	3

Q = .63

rho of Spearman .73

(The underdeveloped countries also show a positive correlation between I and ΔI. See P. Burger op.cit.)

Taking into account the deviations from the positive correlation between I and ΔI shown by Guatemala, Honduras and Ecuador, we present in the following for the low Latin American Countries the values corresponding to the total universe as well as to the sample which excludes the above mentioned three deviant cases. Table 5 shows the correlations between our major variables:

Table 5

Latin American Countries

Relationship	total rho	high Q	high rho	high rho	low with Ecuador Honduras and Guatemala rho	low with Ecuador Honduras and Guatemala rho	low without Ecuador Honduras Guatemala Q
T/ΔI	-.12*	-.71*	-.09*	-.11**	-.20*	-.17**	-.60
T-ES/ΔI	-.31*	-.71*	-.10*	.20**	-.35*	-.42**	-1.0
T/I	-.05	.71	-.05		-.33		-.60
T-ES/I	-.45	.71	-.26		-.50		-1.0
T-ES/T	.73	1.0	.75		.89		1.0
I/ΔI	.22*	-1.0*	-.82*	-.10**	.73*	.80**	1.0
E-I/I	.01	.38	-.19		-.20		-.60
U-I/I	-.04	.88	.36		-.57		-.60
ES-I/I	-.08	-.38	-.07		-.50		0
A/ΔI	-.10*	-.45*	.32*	.25**	-.08*	-.08**	-.33
				.53***		-.51***	
A/I	-.55	.45	-.35	.32*	-.03		0
	Q		Q		Q		Q
T/D+LM	-.33		-.33		-.14		1.0
A/D+LM	.09		-.20		(-1.0)		(-1.0)
D+LM/ΔI	-.49		0		-1.0		-1.0
T-ES/D+LM	.09		.33		(-1.0)		(-1.0)
D+LM/I	-.68		0		.14		-1.0

() : problematic relationships

* : 1945 - 1959

** : 1960 - 1965

*** : 1954 - 1959

The operationalizations of the variables included are the following:

I = income per capita (as before)
Δ I = growth rate of income per capita (as before)
T = developmental tension (E-I + U-I)
A = (educational) authoritarianism (% of the population at primary school age in primary school multiplied by % of secondary school enrolment on the basis of primary school enrolment, minus ES

The values of E (literacy), U (% of population living in urban centers of 20'000 inhabitants or more), I and ES (% of economic active population with medium and high prestige occupations) coincide with the data used for the "Paradigma".

D/MD = Demonstrations (D) and macro-demonstrations (MD) (indicator of conflict elaborated by I.K. and R.L. Feierabend)

LM = Martial Law (indicator of conflict elaborated by I.K. and R.L. Feierabend).

On the world level, both indicators of conflict function with respect to T' (see M. Mora y Araujo, Structural Tension, Political Stability and Economic Development, in: Bulletin des Soziologischen Institutes der Universität Zürich, 4, 1967, pp.80), Δ I and the difference between the correlations of A with ΔI according to the level of conflict, in a similar way. (See Eduardo Archetti, Some Effects of Structural Tension and the Lead of the Educational System, in: Bulletin, 6, 1968.) We compare the Latin American countries, the Argentinian provinces and the departments of the province of Tucumán, with respect to the following relationships:

$T/\Delta I$, $T-ES/\Delta I$, T/I, $T-ES/I$, $I/\Delta I$

We also divided the Argentinian provinces between high and low establishing the cutting point in such a way as to obtain a maximum of differences and changes of sign between the correlation coefficients encountered. (See Omar Argüello, Structural Tension (T) and Models of Development, in: Bulletin,6,1968.)

The theoretical difference of most importance among the two groups of provinces refers to the inverted sign of the correlations between the growth rate of the income per capita (1953-58) and the T-values for 1960, compared with the positive correlations between the T-values for 1947 and the same growth rates (1953-58). We assume that in the case of the high provinces the growth of I produced by T contributes to decrease the T-values of the following period, whereas among the low provinces the same growth appears to be associated with an increase of the subsequent T-values. Table 6 summarizes the values of the coefficients for the years 1947 and 1960. For 1960 no coefficients for the relationships with ΔI are given because the comparable relationships are interpreted in the sense of T or T-ES determining ΔI and not in the opposite direction.

Table 6

Relationships	Provinces total 1947	Provinces total 1960	Provinces high 1947	Provinces high 1960	Provinces low 1947	Provinces low 1960	Departments of Tucumán 1947	Departments of Tucumán 1960
$T/\Delta I$	.43	--	.51	--	.56	--	.06	--
$T\text{-}ES/\Delta I$	.17	--	.20	--	.49	--	-.30	--
T/I	-.68	.19	.10	.18	-.20	-.16	0	-.05
$T\text{-}ES/I$	-.73	-.31	-.66	-.29	-.49	-.25	.42	-.67
$I/\Delta I$	-.02	--	-.01	--	-.27	--	-.88	--

In order to make easier the comparison between different levels of units, Table 7 summarizes the correlations by indicating only the sign of the relationship. We also include the relationships we found on the world level for developed and underdeveloped countries.

Table 7

Relationships	Latin American countries high	Latin American countries low*	Argentina provinces** high	Argentina provinces** low	Departments of Tucumán	developed countries	underdeveloped countries
$T/\Delta I$	-(Q)	-(-)	+	+	0	+	+
$T\text{-}ES/\Delta I$	-(Q)	-(-)	+	+	-		
T/I	+(Q)	-(-)	((+))	-	0	-	+
$T\text{-}ES/I$	+(Q)	-(-)	-	-	+		
$I/\Delta I$	-	+(+)	0	-	-	-	+

* Including Guatemala, Honduras and Ecuador; signs between brackets indicate the correlations calculated for the sample which excludes these three countries. The correlations found for both samples have the same signs.

** Excluding Tierra del Fuego and with respect to T-ES also Buenos Aires.

(()) indicates very low correlations.

The correlations of Table 7 show certain consistencies:

1) $T/\Delta I$ and $T\text{-}ES/\Delta I$ have the same signs.

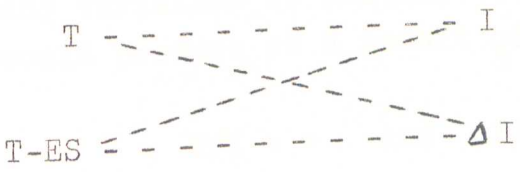
2) T/I and $T\text{-}ES/I$ also have the same signs (with the exception of the high provinces).

3) The correlations are internally consistent. They form clusters of selfsustained relationships. In more precise terms: two of the relationships (or groups of relationships): for example $T/\Delta I$ and $T\text{-}ES/\Delta I$, on the one side, and T/I and $T\text{-}ES/I$, on the other, determine the third relationship, in our example $I/\Delta I$. This means that this system of relationships shows a certain autonomy. This is especially true for the high and low Latin American countries, the low provinces and the developed and underdeveloped countries, less so for the high

provinces and the departments of Tucumán. For a more precise analysis of clusters within the Latin American samples see graphs, pp. 34.

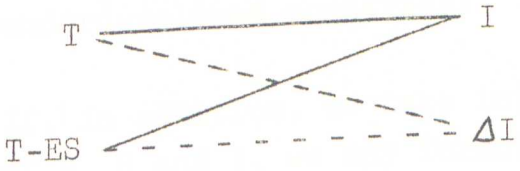
The following graphs show this consistency.

Graph 1



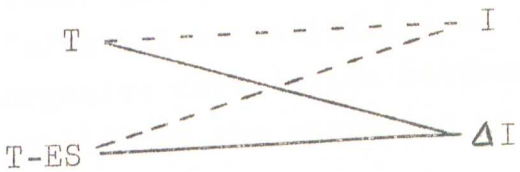
Low Latin American countries

Graph 2



High Latin American countries

Graph 3



Low Argentinian provinces

Graph 4

Underdeveloped countries

It is important to note that all logically possible combinations of mutually consistent positive and negative relationships between T, I and Δ I are represented by the contexts compared.

II.

The most simple model of development determined by T may be summarized by the following two causal relationships:

$$T \xrightarrow{+} \Delta I \quad \text{and} \quad \Delta I \xrightarrow{+} T$$

Any variation of the initial values of T of the units considered would produce as a result of the process:

$$T/I : + \quad \text{and} \quad I/\Delta I : +$$

(These two relationships are characteristic for the group of the underdeveloped countries)

If, in addition, we take into account the varying accessibility of U, E and I, we may formulate the following hypothesis with respect to the initial phase of the process of development: The lower the I-values the more the units will make use of this differential accessibility of societal status. This will produce a negative correlation between T and I. This hypothesis can be applied to the variation of the initial values of T as mentioned above.

The system of Argentinian provinces represents the sequence from the initial to the main phase of the process if the rank of the provinces is considered as an indicator of the phase.

Table 8

	Low provinces	1947	High provinces
T/I	-.20		.10
T/ΔI	.56		.51

The period from 1947 to 1960 shows the same trend with respect to T/I.

Table 9

	Low provinces		High provinces		All provinces	
	1947	1960	1947	1960	1947	1960
T/I	-.20	-.16	.10	.18	-.68	.19

All changes between 1947 and 1960 go in the direction of more positive or less negative coefficients.

If we apply these considerations to the international system, we reach the following conclusions:

a) The underdeveloped countries represent the main phase of the process: T/I : + and T/Δ I : + ; and

b) the developed countries represent the initial phase: T/I : - and T/Δ I : + .

If this were correct it would mean that the developed countries are gradually becoming involved within a process of development determined by T.

In the following we shall briefly consider the countries of intermediate rank, i.e. between the developed and underdeveloped nations. The ranges of ranks corresponding to developed and underdeveloped countries are determined on the basis of the patterns relating to T/I, I/Δ I and Δ U/ ΔI.

These intermediate or middle stratum countries form part of the group of the "industrial revolution societies" as defined by Bruce Russett. The rank of I of the intermediate countries varies between : Japan (11,9) and USSR (23,3).

We shall now try to determine the rank correlation patterns within this group, taking into account that the T indicator

used before is not quite satisfactory here because of the relative saturation of E (illiteracy). Instead of T we shall use E'-I[1]. As a result of this procedure we detect two sub-groups, neither of which does include Ireland, Cyprus, Bulgaria, Greece and Iceland.

Table 10

	I	E' - I	ΔI	U - I
Japan	11.9	68.6	100	52.2
Rumania	14.0	61.1	90.8	13.0
Trinidad	16.4	48.2	78.9	95.9
Poland	18.4	51.8	76.3	29.3
Argentina	19.0	51.2	-5.3	50.3
Italy	20.0	40.9	71.0	25.3

The correlations are the following:

I/ΔI : -
I/E'-I : -
E'-I/ΔI : + (low, especially because of Argentina) and
U - I : no correlation .

If we considered E'-I as a substitute for T, this group of countries would be similar to the low Argentinian provinces (see graph 3).

1) E' calculated by H. Ries et al., Education Variables, to be published in: Bulletin des Soziologischen Institutes der Universität Zürich.

Table 11

	I	E'-I	Δ I	U - I	U - I	Δ I
Panama	12.8	51.0	21.1	36.7	54.5	17.1
Chile	14.7	54.2	17.1	54.5	36.7	21.1
Hungary	19.0	59.3	63.2	36.3	36.3	63.2
Puerto-Rico	21.8	56.7	65.7	20.1	29.7	75.0
USSR	23.3	68.0	75.0	29.7	20.1	65.7

The correlations are the following:

$I / E' - I : +$ $\qquad$ $I / \Delta I : +$

$E' - I / \Delta I : +$ $\qquad$ $U - I / \Delta I : -$

If we considered E'-I as a substitute for T, this group would be similar to the underdeveloped countries (see graph 4). However, U-I/ΔI is strongly negative (see p. 29-30).

The first group of middle stratum countries could be interpreted as a group of societal units which is entering into the process of development determined by T (initial phase).

Our simple model serves to discriminate between low and high provinces and between underdeveloped and developed countries. It does not serve to discriminate between these contexts and the Latin American countries.

III.

The low Latin American countries show no absorption of T ($T/\overrightarrow{\Delta} I : -$). This may be the consequence of a high degree of rigidity of the power structure and of external dependency (see Rubén Kaztman, Dependency and Absorption of Social Tensions in Underdeveloped Countries, in: Bulletin, 6, 1968.

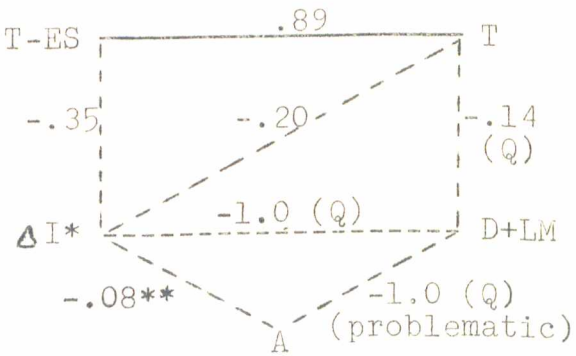
Table 12

	Low Latin American Countries			
Δ I	1945-1959	1954-1959	1960-1965	1963-1965
T	-.20	-.14	-.17	-.18
T-ES	-.35	-.22	-.42	-.47

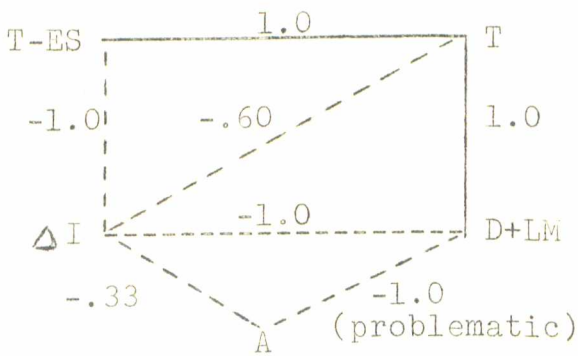
We observed that the low Latin American countries show an internally consistent and distinct configuration with respect to the variables used for the contextual comparison (see graph 1). The two following graphs (5 a and b) may give some support to the hypothesis concerning one particular cause of the non-absorption of T within this group, i.e. the rigidity of the power structure.

Graph 5

a)
Low Latin American Countries including Guatemala, Honduras and Ecuador (rho)



b)
Low Latin American Countries excluding Guatemala, Honduras and Ecuador (Q)



* : 1945 - 1959

** : A/Δ I (1954-59): -.51

On the world level, we find the following relationships for demonstrations (D) and macro-demonstrations (MD):

Table 13

Conflict	Conflict high A/ΔI	Conflict low A/ΔI	A/Conflict	T'/Conflict	Conflict/ΔI
Demonstrations	-1.0	-.64	-.44	.26	-.51
Macro-Demonstrations	-1.0	-.59	-.30	.32	-.61

These relationships are repeated among the low Latin American countries if Guatemala, Honduras and Ecuador are excluded. Among all the types of conflicts considered (demonstrations, macro-demonstrations, mass arrests, macro-strikes, martial law, organization of opposition parties, status quo conflicts, coups d'état) only demonstrations and macro-demonstrations show this configuration.

Graph 6

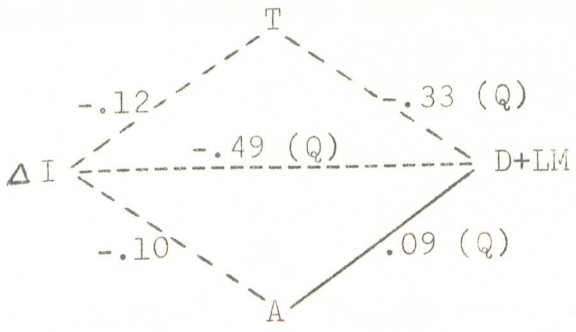
This type of conflicts (together with martial law in the case of the low Latin American countries without Guatemala, Honduras and Ecuador) represents an indicator for the level of (political) rationality as determined by the interaction of T and A and the rigidity of the structure:

$T \xrightarrow{+}$ conflict $\xrightarrow{-}$ ΔI and A/ΔI (: -) with high conflict (absolute values) > A/ΔI (: -) with low conflict.

This means that the low Latin American countries (without Guatemala, Honduras and Ecuador) are representative for the absence of an absorption of T by the power structure of the society, i.e. a high level of externally induced anomic tensions.

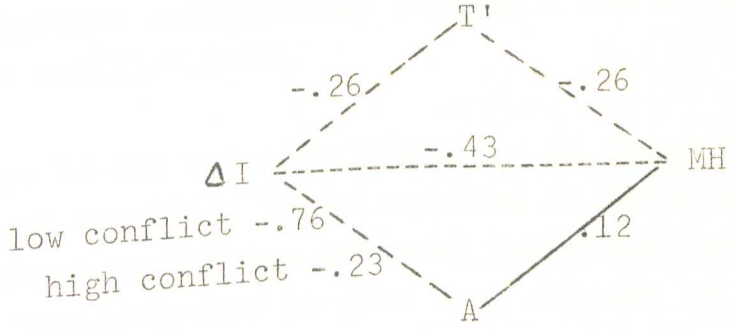
For all Latin American countries these conflicts (D + LM) form part of the following configurations:

Graph 7



This configuration coincides on the world level with the configuration which is characteristic for macro-strikes (MH):

Graph 8

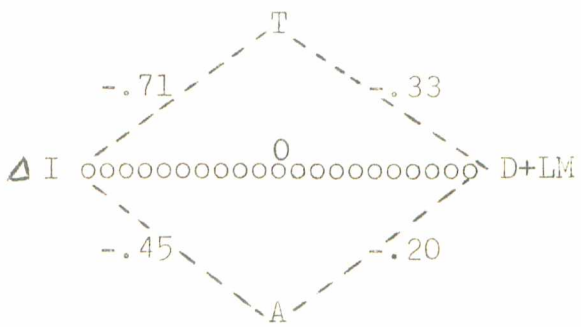


This configuration, i.e. T $\xrightarrow{-}$ conflict $\xrightarrow{-}$ ΔI (as well as the opposite one T $\xrightarrow{+}$ conflict $\xrightarrow{+}$ ΔI) means that the conflict considered does not serve as an indicator of the level of rationality as determined by the interaction of T and A and the rigidity of the structure.

On the level of the universe of the Latin American countries T appears as functional for economic development (Δ I) as far as it prevents the same type of conflict (demonstrations, macro-demonstrations and martial law) which also among the low countries is negatively associated with Δ I. However, in spite of the fact that the relationships between T and conflict (D + LM) (-.33) and between conflict and Δ I (-.49) are relatively strong, they do not invert the negative correlation existing between T and Δ I.

The high Latin American countries have the following configuration (Q):

Graph 9



The negative relationship between T and ΔI is here independent of the conflict D+LM.

On page 13 the relation T/Δ I : - we found for the low Latin American countries is interpreted in terms of the rigidity of the structure and the external dependency of these countries. It is necessary now to give some support to the interpretation in terms of external dependency through the introduction of other variables.

We shall use as an indicator of dependency in the international system the values for foreign trade (imports and exports) expressed as a percentage of the GNP (B. Russet, World Handbook of Political and Social Indicators, New Haven 1964, pp. 162).

For obvious reasons, this indicator is only applicable to underdeveloped countries.

1) If we consider GNP as an indicator of the power basis, we hypothesize a negative correlation between GNP and foreign trade / GNP for the underdeveloped countries.

Table 14

Dependency	GNP high	GNP low	d %
h (41% or more)	2 (7,7%)	12 (44,4%)	-36.7 %
l (40% or less)	22 (92,3%)	15 (65,6%)	+36.7 %

2) If we assume that T as the structural basis of nationalism is opposed to the dependency of the nation, we hypothesize a negative correlation between T and dependency for the underdeveloped countries.

Table 15

T	Dependency high	Dependency low	d %
h	8 (40 %)	25 (67,5 %)	-27.5 %
l	12 (60 %)	12 (32.5 %)	+27.5 %

3) If we assume that high T values require a strong power basis, we hypothesize a positive correlation between T and GNP for the underdeveloped countries.

Table 16

		G N P	
		high	low
T	hh	13	7
	h	6	7
	l	2	8
	ll	3	5

Table 17

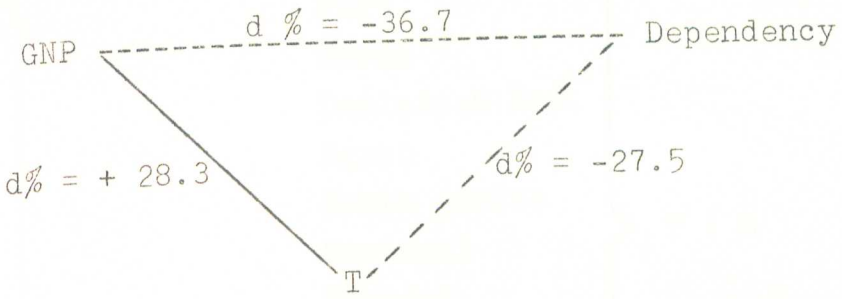
		G N P		
		high	low	d %
T	h/hh	19 (79,1 %)	14 (51,8 %)	+27.3 %
	l/ll	5 (20,9 %)	13 (48,2 %)	-27.3 %

Table 18

		G N P		
		high	low	d %
T	hh	13 (54,2 %)	7 (25,9 %)	+28.3 %
	h/l/ll	11 (45,8 %)	20 (74,1 %)	-28.3 %

The three hypotheses are confirmed and can be represented by the following graph:

Graph 10



Dichotomizing the variables T and dependency, we can distinguish the following 4 categories of countries:

Table 19

		Dependency: high	Dependency: low
T	h	contradictory countries	stable nationalist countries
	l	stable dependent countries	disposable countries

The stable countries are to be found along the diagonal of the negative correlation mentioned above.

Table 20

Stable Dependent Countries		GNP : High Values : 2'000 or more, low values less than 2'000	
Liberia Rhodesia and Nyassaland	T : 11	Libya Congo (Kinshasa) Jordan El Salvador	T : 1

GNP

1 : 6

h : 0 = 0 %

Stable Nationalist Countries

Thailand	T : h h	Peru
Panama		Burma
Paraguay		Dominican Rep.
Israel		Egypt
Greece		South Africa
Argentina		Portugal
Colombia		Ecuador
Chile		Mexico
Japan		Brazil
Taiwan		China
Philippines		
Spain		
Yugoslavia		
South Korea		
USSR		

T : h

GNP

1 : 8
h : 17 } h = 68 %

The percentages of the countries from each category which have high GNP values are the following:

Table 21

Stable nationalist countries	68 %
Disposable countries	41,7%
Contradictory countries	25 %
Stable dependent countries	0 %

We may interpret the disposable countries as those which still are not oriented towards one of the two main alternatives, i.e. stable nationalism or stable dependency.

Table 22

Disposable Countries

Nigeria, Sudan, Haiti, Ethiopia, Pakistan } T : 1 1

Honduras, Guatemala, Morocco, Cambodia, Turkey, India } T : 1

GNP
1 : 7
h : 5 } h = 41.7 %

Contradictory Countries

Ceylon, Cuba, Venezuela, Costa Rica, Syria } T : h h

Bolivia, Lebanon, Nicaragua } T : h

GNP
1 : 6
h : 2 } h = 25 %

It seems probable that the disposable countries with low GNP will tend to choose the alternative of stable dependency in the future. This would apply to the following nations:

Honduras
Haiti
Sudan
Guatemala
Cambodia
Ethiopia
Morocco

On the other hand, the disposable countries with a relatively high GNP may be able to choose the other alternative, i.e. stable nationalism. The corresponding list of nations would be the following:

Indonesia
India
Pakistan
Turkey
Nigeria

The Latin American countries (with the exception of Uruguay) can be classified in the following way:

Stable Nationalist Countries

Panama
Paraguay
Argentina
Colombia
Chile
Peru
Dominican Republic
Ecuador
Mexico
Brazil

Stable Dependent Countries

El Salvador

Disposable Countries

Haiti
Honduras
Guatemala

Contradictory Countries

Cuba
Venezuela
Costa Rica
Bolivia
Nicaragua

The relationship between stage of development (I) of the Latin American countries and the above mentioned four categories of countries is the following:

Table 23

	Low Latin American countries	High Latin American countries*
Disposable countries	Haiti, Honduras, Guatemala 3	
Stable dependent countries	El Salvador 1	
Contradictory countries	Bolivia Nicaragua 2	Cuba Costa Rica 2
Stable nationalist countries	Paraguay Peru Ecuador 3	Panama, Argentina, Colombia, Chile, Dominican Republic, Mexico, Brazil 7

* Uruguay is lacking.

The location of the high Latin American countries in the categories of stable nationalist and contradictory countries presents no problem. The same is not true for the location of the low countries which are represented within all four categories. Among the disposable countries we find two (Guatemala and Honduras) of the three low Latin American countries which disturb the interpretation of this group of countries in terms of the rigidity of the structure. Peru, Paraguay and Ecuador are stable nationalist countries. It seems that in the cases of Peru and Paraguay the degree of internal contradictions as determined by T and the rigidity of the structure is independent

of external dependency. Not so in the case of Bolivia and Nicaragua.

Table 24

			Internal Contradictions	T-ES
Dependency	h	h	Bolivia	60.8
			Nicaragua	9.6
		l	El Salvador	-10.6
	l	h	Peru	10.7
			Paraguay	66
			Ecuador	45
		l	Honduras	-4.5
			Haiti	3.4
			Guatemala	-4.0

IV.

In the following we shall try to explain the negative relation between T and ΔI among the high Latin American countries.

We may first point out that among the high Latin American countries the correlation between U-I/I is .36 whereas the same correlation among the low Latin American countries is -.57.

Among the world sample of nations we find for different ranges of U-I values the following correlation coefficients for $U\text{-}I/\Delta I$.

Table 25

Ranges of U-I (world level)	U-I/Δ I	Latin American Countries
9.3 - 17.5	.27	Peru, El Salvador, Guatemala, Honduras
18.3 - 95.9	.37	Chile, Argentina, Venezuela, Panama, Brazil, Mexico, Columbia, Bolivia, Ecuador, Paraguay
9.3 - 95.9	.12	

As can be seen, the high Latin American countries with the exception of the three countries underlined, fall into the range of high U-I values.

But with regard to the increase of the positive correlation coefficients of U-I/Δ I for the two successive ranges of U-I values, the high Latin American countries behave in a different way (see also P. Heintz, The Place of Latin American Societies in the International Stratification System, in: Bulletin des Soziologischen Institutes der Universität Zürich, 3, 1967 pp. 1).

However, if we divide the U-I values of the world sample of nations in three parts, we get the following coefficients:

Table 26

U - I	U - I /Δ I	N
h	.21	22 (middle stratum)
m	.58	13
l	.56	19
Total	.12	54

The lowest coefficient belongs to the middle stratum countries.

The most revealing table which characterizes the high Latin American countries is the following:

Table 27

Countries	U-I standardized (world level)	ΔI (1945-59)	T standardized (world level)
Chile	54.5	0.9	121.1
Argentina	50.3	0.5	119.0
Cuba	37.9	1.3	99.9
Panamá	36.7	1.3	90.6
Brazil	30.6	3.4	69.4
Mexico	25.7	2.9	66.6
Columbia	23.3	2.1	76.0
Costa Rica	9.1	3.3	75.8
Dominican Rep.	7.3	3.6	58.8

U - I /ΔI rho -.82; T /ΔI rho -.92; U - I / T rho .87.

ΔI is negatively correlated with T and U-I and T is positively correlated with U-I.This result may be partially explained by the findings obtained by H.B. Bofinger, M. Dechmann et al (T as Development Drive, in Bulletin des Soziologischen Institutes der Universität Zürich, 4, 1967, pp. 102) and by Mora y Araujo (op.cit.). The negative correlation between U-I and ΔI is also characteristic for the second group of countries of the middle stratum mentioned above (Table 11, p. 13).

In addition, some high Latin American countries seem to approximate the saturation level of U.

Table 28

	I	ΔI (1945-59)	U	ΔU
Argentina	550	0.5	48	3.4
Cuba	375	1.3	37	5.3
Panama	350	1.3	22	5.0
Columbia	300	2.1	22	9.7
Costa Rica	250	3.3	18	8.8

The correlations are: U/I : +; I/ΔI : -; U/ΔI : -; U/ΔU : - (see P. Heintz, The Mobility of Nations Belonging to the International Upper Stratum, in: Bulletin des Soziologischen Institutes der Universität Zürich, 4, 1967 pp. 68).

The departments of Tucumán behave in a way rather similar to the high Latin American countries.

Table 29

Departments of Tucumán

U - I / I	:	.38
U - I /ΔI	:	-.22
U /ΔU	:	-.20
U - I / T	:	.90
E - I / T	:	-.19

The following table points to the fact that, on the world level, with increasing values of E' and U the values $(E'-I)^2$ and $(U-I)^2$ are also increasing rather continuously but we can also appreciate the different behaviour of E'-I and U-I.

Table 30

E' standardized	$\sum \frac{(E'-I)^2}{N}$	U standardized	$\sum \frac{(U-I)^2}{N}$
90 - 100	3'594.49	90 or more	9'689.81
80 - 90	2'670.97	80 - 90	3'894.49
70 - 80	3'086.17	70 - 80	1'640.53
60 - 70	2'666.95	60 - 70	2'457.06
50 - 60	2'301.98	50 - 60	1'581.39
40 - 50	1'682.26	40 - 50	641.93
30 - 40	1'132.11	30 - 40	726.76
20 - 30	563.69	20 - 30	338.87
10 - 20	126.68	10 - 20	116.85
		0 - 10	13.75

The U-I values are growing more rapidly with high U values than the E'-I values with high E' values.

The strategic location of U and U-I for understanding the meaning of the negative relationship between T and ΔI among the high Latin American countries becomes clearer if we also consider a configuration of relationships present in a group of countries of the international middle stratum. This configuration includes the following countries:

Chile	USSR
Argentina	Rumania
Hungary	Yugoslavia
Greece	Czechoslovakia
Poland	

The correlations which are relevant for our discussion are the following:

T /ΔI : -.91
U - I /ΔI : -.90
T / U - I : .95

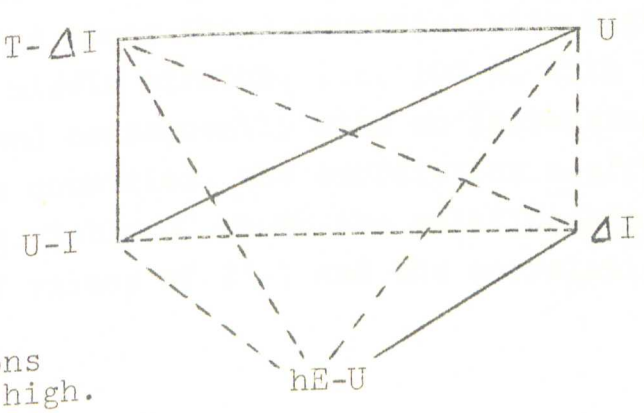
On the other hand, there is a low negative correlation between T and E-I (-.20). The degree of deviation from the pattern T/ΔI operationalized as T-ΔI (standardized values) shows extremely high correlations with ΔI and U :

T - ΔI / ΔI : -.98
T - ΔI / U : .95
T - ΔI / U - I : .88

Finally, the strategic position of U is also described by the fact that the correlation coefficient (rho) between hE (higher education) - U and ΔI is .80.

These relationships are summarized in the following graph:

Graph 11



All associations are extremely high.

These data point out that within the inernational middle stratum the deviation from the pattern T/ΔI : + measured by the indicator T - ΔI is highly associated with U - I and hE - U.

If we divide the T values in three equal groups (22, 21 and 22 countries), we get the following correlation coefficients for T/ΔI.

Table 31

T values standardized world level	T/ΔI	N	Latin American countries h	l	h + l
1 - 22 (h)	.13	22	3		3
23 - 43 (m)	.31	21	3	4	7
44 - 65 (l)	.15	22		3	3

The global coefficient is .48.

If we consider as middle stratum the nations which have I values between 15 and 49, we observe that out of the total of such countries (23) 17 have high T values, i.e. 74 %. In other words, the middle stratum nations belong to the group whose correlation coefficient tends to be low.

Furthermore, among the 34 lowest values of E'-I, we find 7 countries belonging to the middle stratum, i.e. 20.6 %, among the 16 intermediate values there are 10 middle stratum countries, i.e. 62.5 %. And among the 9 countries with highest values all belong to the middle stratum, i.e. 100 %. With increasing values of E'-I and consequently with an increasing percentage of middle stratum countries, the correlation coefficients E'-I/ΔI are decreasing. Table 32 shows the relationship between different ranges of values of E'-I and the correlation coefficients for E'-I/ΔI.

Table 32

E'-I standardized values world level	E'-I/ΔI	N
-4.2 - 48.6	.52	34
49.4 - 57.3	.25	16
59.3 - 86.2	-.21	9
-4.2 - 86.2	.42	59

The Latin American countries are distributed in the following way among the three ranges of E'-I values:

Table 33

Ranges of E'-I values	Latin American Countries
-4.2 - 48.6	none
49.4 - 57.3	Peru, Cuba, Chile, Argentina, Panama, Uruguay, Paraguay
59.3 - 86.2	Venezuela, Costa Rica, Brazil, Mexico, Dominican Rep., El Salvador, Honduras, Ecuador, Nicaragua, Haiti.

The other Latin American countries are not included because data are lacking.

Table 34

Latin American Countries *

Ranges of E'-I values	high countries	low countries	d %
-4.2 - 48.6	-	-	
49.4 - 57.3	5 (55.5 %)	2 (28.5 %) (Peru, Paraguay)	+27.0
59.3 - 86.2	4 (44.5 %) (Costa Rica, Brazil, Mexico, Domin.Rep.)	5 (71.5 %)	-27.0

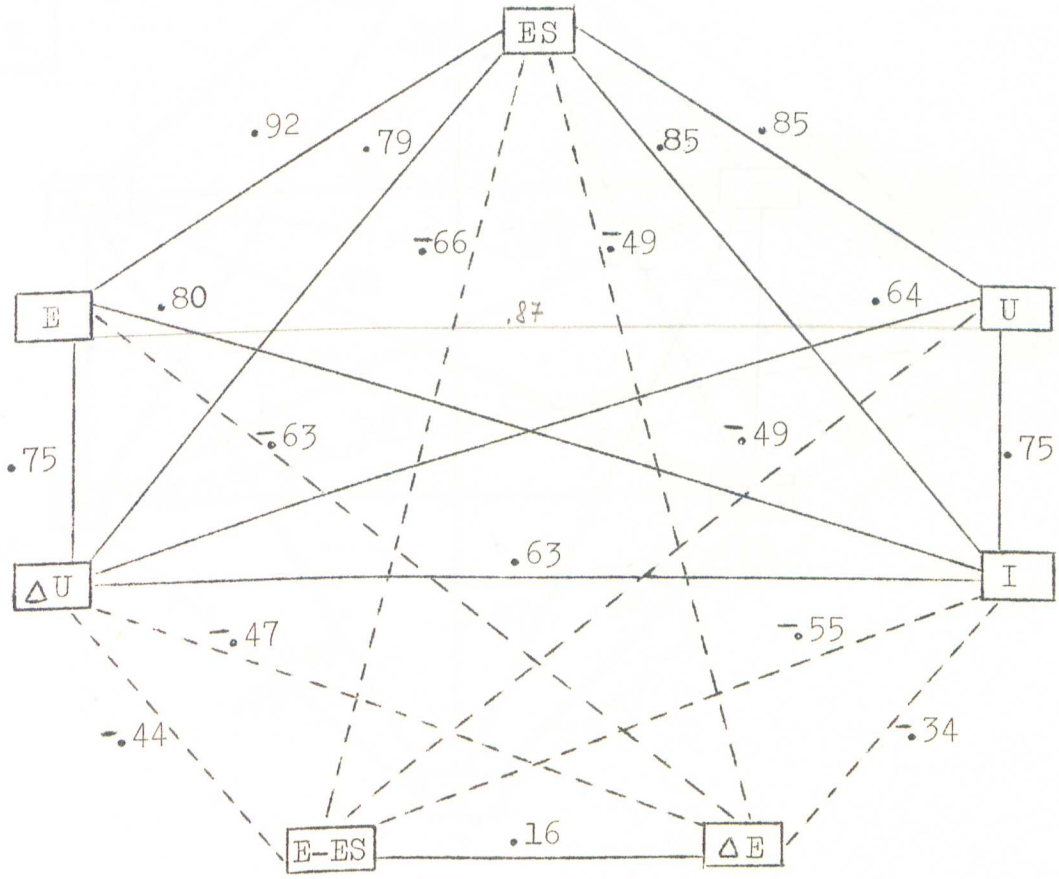
* Venezuela is excluded.

This means that the correlation between the rank of the Latin American countries (I) and the range of E'-I values is negative, i.e. the negative correlation between T and ΔI among the high Latin American countries cannot be explained by high E'-I values. This becomes even clearer if we take into account that Peru is the highest of the low Latin American countries whereas Dominican Republic, Mexico, Brazil and Costa Rica are the lowest of the high Latin American countries. These countries represent the deviations from the correlation mentioned above.

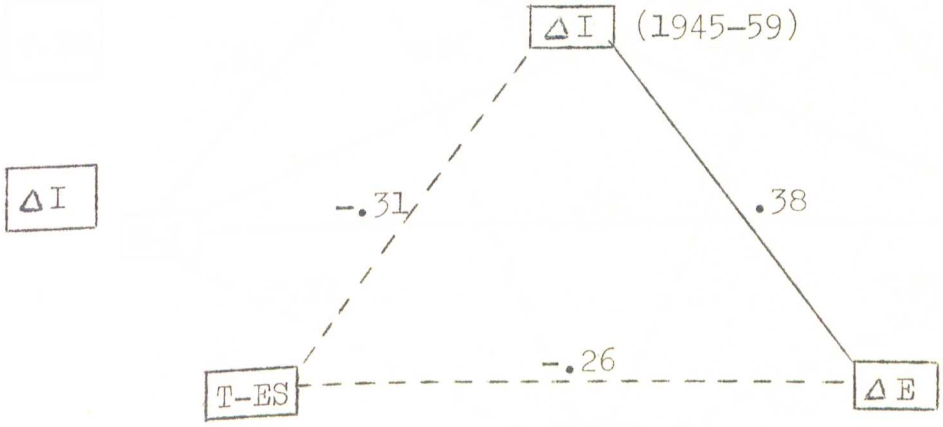
V.

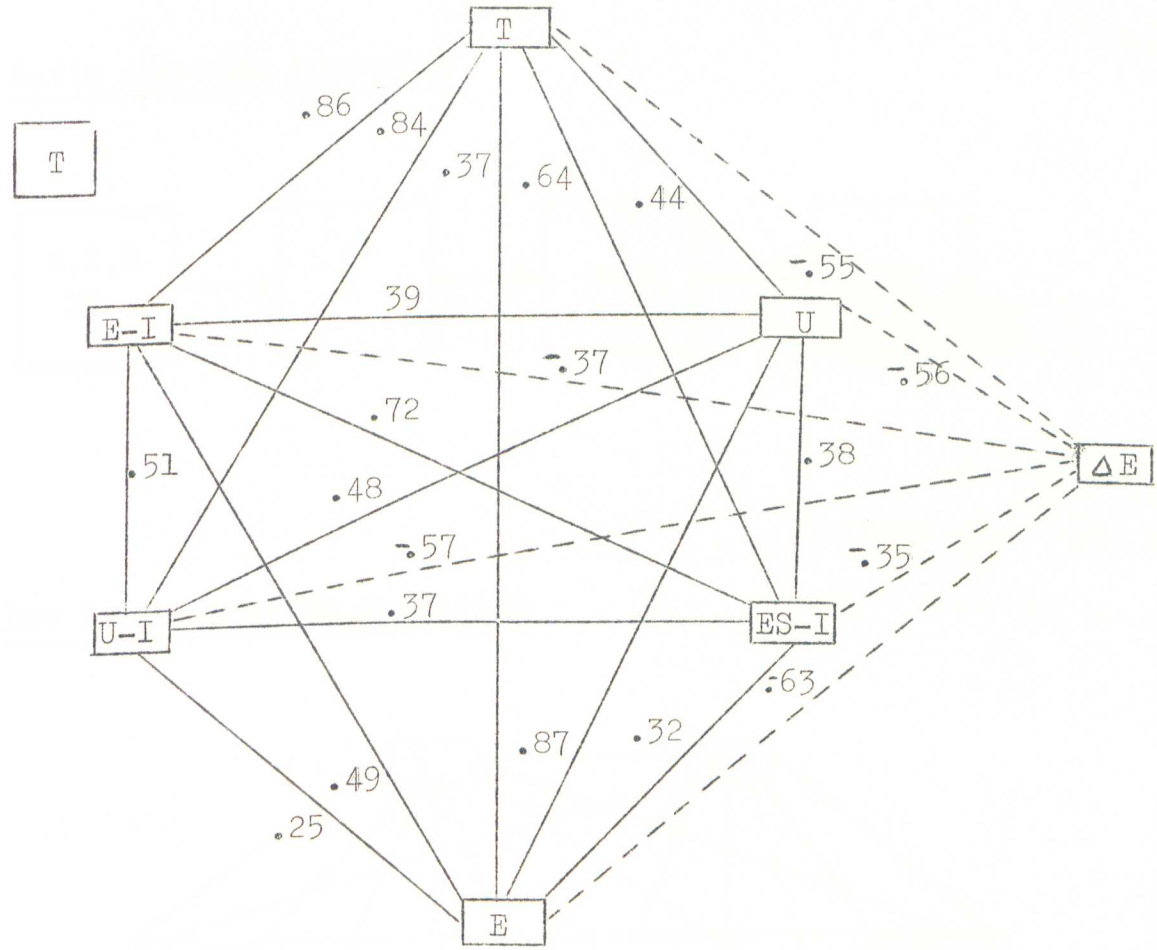
The following graphs give a summary of the specific differences between the low and the high Latin American countries. The corresponding correlation matrices (rho of Spearman) are reproduced in the Annex.

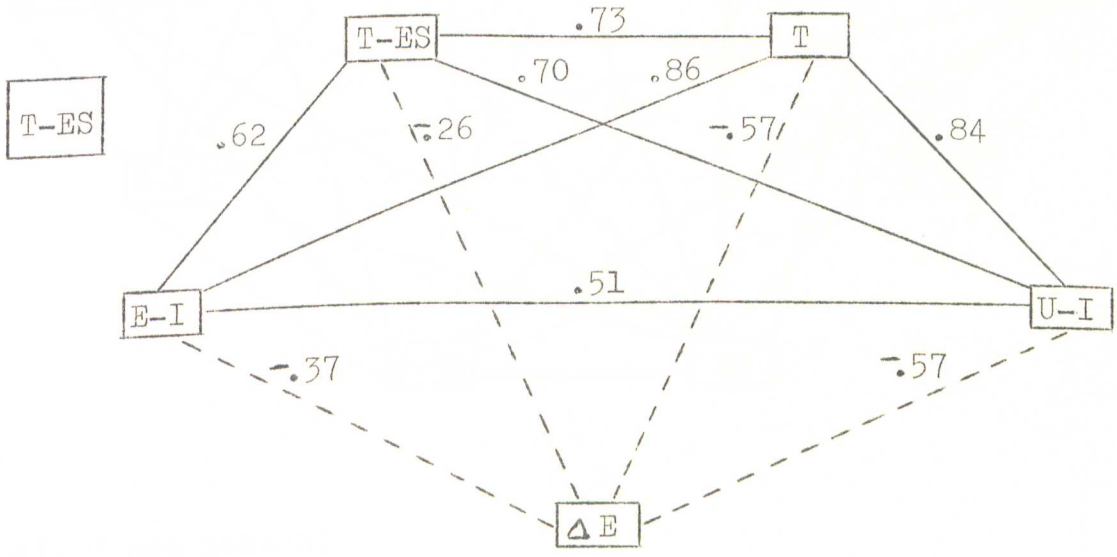
Latin American Countries in General without Venezuela



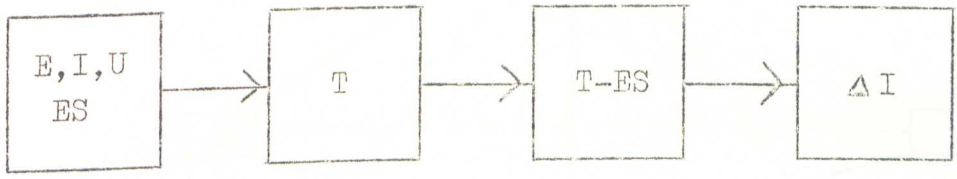
ΔI, T, T-ES are lacking



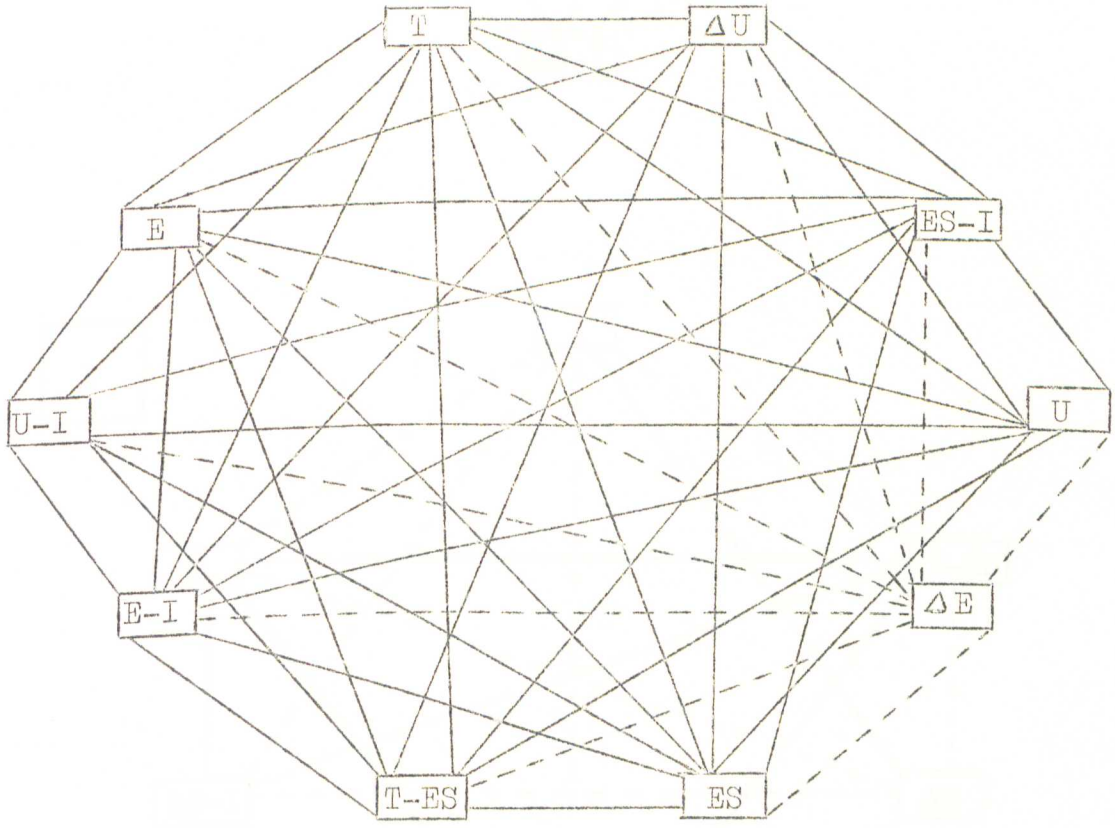

T
.86
.84
.37
.64
.44
.55
39
E-I
U
.37
.56
.72
.38
ΔE
.51
.48
.57
.35
.37
U-I
ES-I
.63
.87
.32
.49
.25
E


T-ES
T-ES
.73
T
.70
.86
.62
.26
.57
.84
.51
E-I
U-I
.37
.57
ΔE

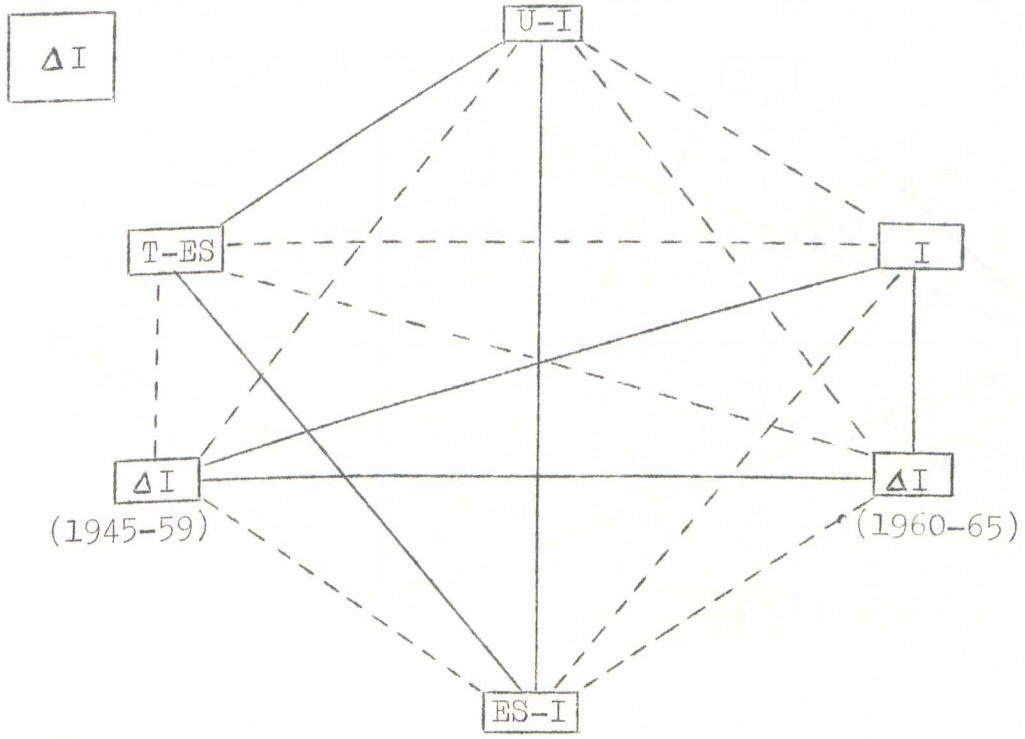
Latin American Countries

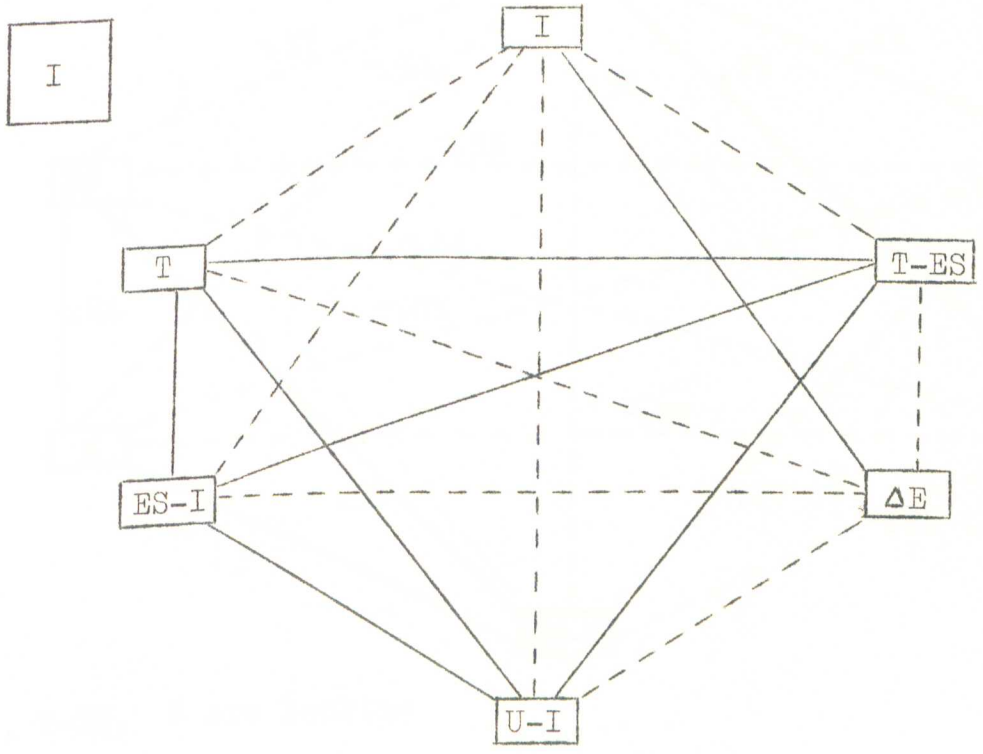


Low Latin American Countries

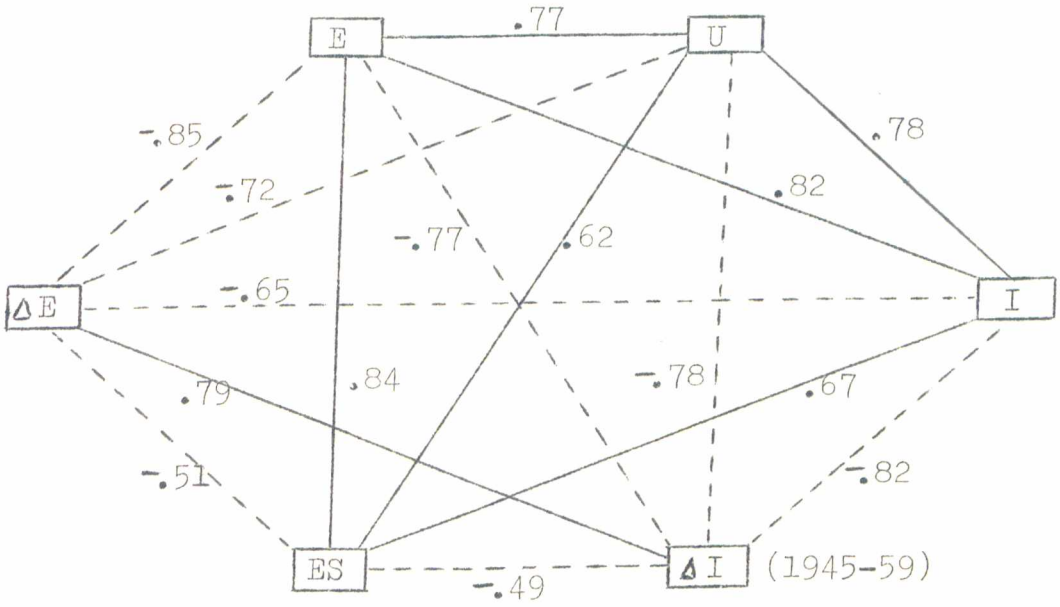


ΔI, I are lacking

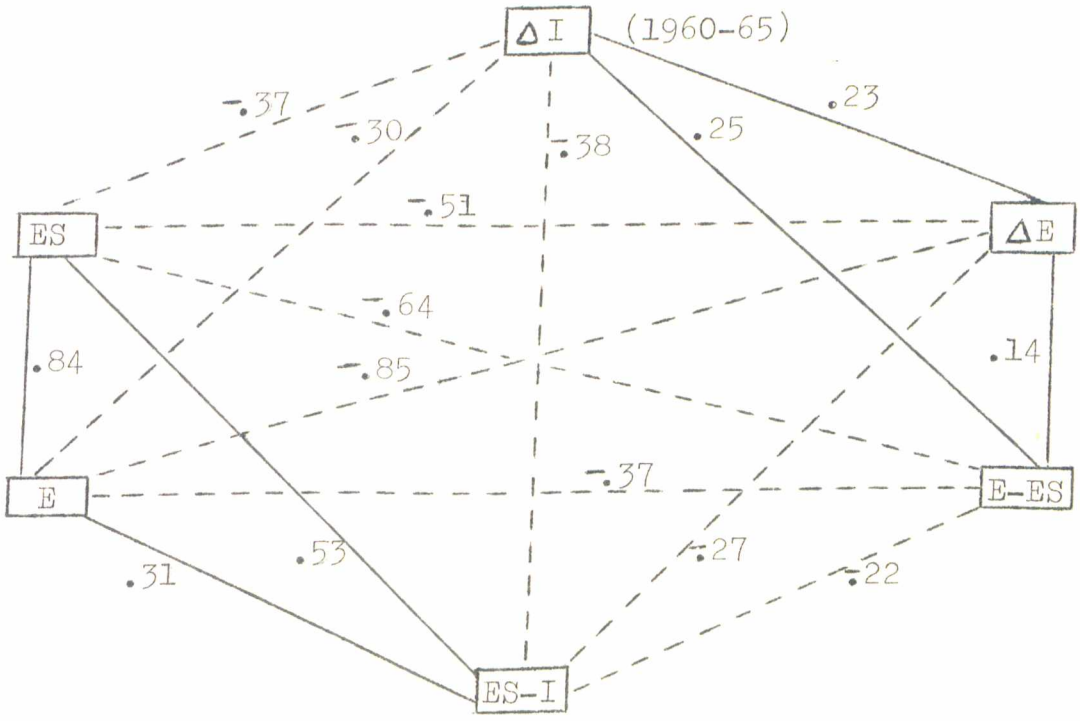

ΔI
U-I
T-ES
I
ΔI
(1945-59)
ΔI
(1960-65)
ES-I


I
I
T
T-ES
ES-I
ΔE
U-I

High Latin American Countries without Venezuela

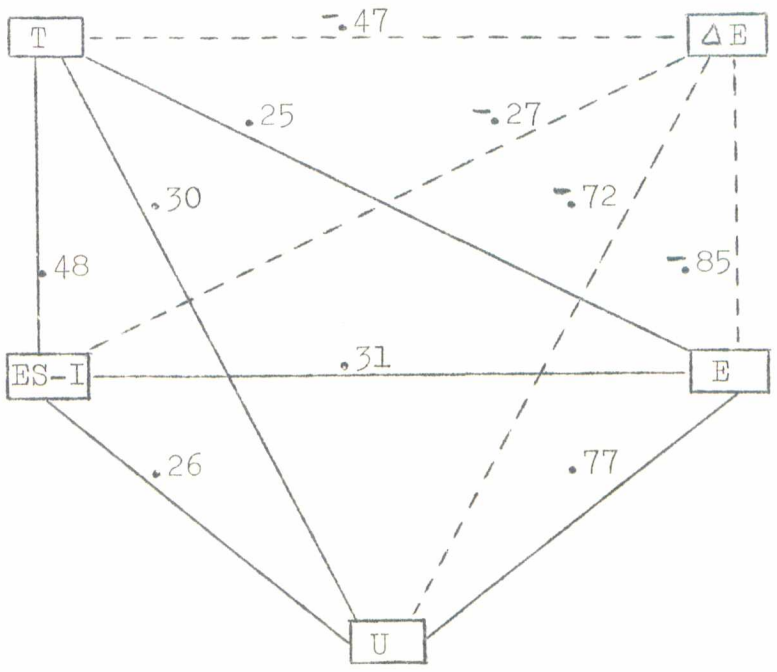


ΔI

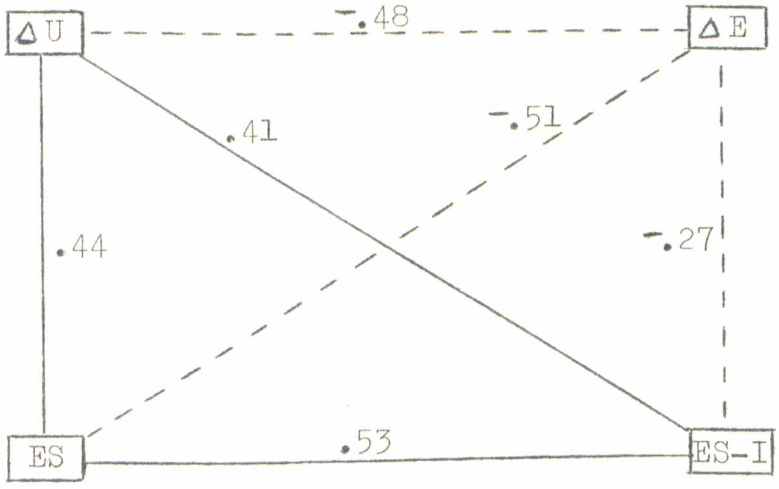


T, T-ES, U are lacking

T



ΔU



T-ES do not form a major cluster.

VI.

Summarizing, we may say that our comparisons refer to three systems of units, the international (world and Latin America), the Argentina and the Tucumán system and to strata of the first (world and Latin America) and second system.

Table 35

Systems	T/ΔI	T/I
International society	+	non linear
Argentina	+	((-))
Tucumán	0	0
Strata		
Developed countries	+	-
Underdeveloped countries	+	+
High Latin American countries	-	+
Low Latin American countries	-	-
High Argentina provinces	+	((+))
Low Argentina provinces	+	-

(()) indicates very low correlations.

1) The most simple model of a self-sustained development based on T includes only two linear relationships:
T $\overrightarrow{/}$ ΔI : +, and ΔI $\overrightarrow{/}$ T : + (see p. 10).

Only the low Argentina provinces fulfil both conditions:
T /ΔI : .56 ; ΔI / T : .58.

2) If we take into account the differential accessibility of the societal status E, U, and I, without considering the effects of T on economic development, we may hypothesize that with decreasing values of I the leads due to the differential

accessibility will tend to increase. The ensuing distribution (T/I : -) may be characteristic for the initial distribution of the T values in the sense mentioned above (p. 10). If we order the 5 contexts according to their relative degree of development achieved, i.e. from low to high : low Latin American countries - low Argentina provinces - high Latin American countries - Tucuman - high Argentina provinces, we find that the correlation coefficients T/I change in a systematic way towards more positive or less negative values, i.e. the model based on (1) and (2) seems to be applicable to all contexts with respect to T/I.

Table 36

	T/I rho	T-ES/ΔI rho			T/ΔI
Low Latin American countries	-.33	process of increasing flexibility of structure	-.35		-.20
Low Argentina provinces	-.20		.49	accumulative process of decreasing rationality	.56
High Latin American countries	-.05		-.10		-.09
Tucuman	0		-.30		.06
High Argentina provinces	.1 0		.20		.51

mean .03 .18

The "process" as indicated by this series of contexts is in agreement with the behaviour of the model : T $\overrightarrow{/\Delta}$ I : +, and ΔI $\overrightarrow{/}$ T : +, such as it is suggested by the underdeveloped countries, and by a state of departure characterized by T/I:-.

3) The first phase of development based on T is characterized by a strong disequilibrium and tension between T and ES, and also between E and ES or A (see E. Archetti, op.cit.). The

low Latin American countries represent this phase: T-ES/ΔI (1960-65) : -.42; A/ΔI (1954-59) : -.51.

4) The intermediate phase is characterized by a disequilibrium between U and E (U>E) which has negative consequences for economic development (see Bofinger, Dechmann et al., op.cit. and M. Mora y Araujo, op.cit.). This phase is represented by the following sequence: low Argentina provinces - high Latin American countries - Tucumán.

Table 37

	U-I/ΔI	U-I/E-I	ΔU/ΔI
Low Argentina provinces	.44	.36 (1947)	.20
High Latin American countries	.09 (1960-65)	.35	-.27 (1945-59) -.17 (1954-59)
Departments of Tucumán	-.22	-.59 (1947)	-.42

5) The last phase is characterized by reaching the level of relative saturation of U and consequently by a negative correlation of $\Delta I/\overrightarrow{U}-I$. This phase is represented by the high Argentina provinces.

Table 38

	Argentina Provinces	
	high	low
ΔI / U - I	-.12	.43

A certain saturation of U can already be observed among the high Latin American countries:

Table 39

	ΔI (1945-59)	ΔI (1954-59)	ΔI(1960-65)	ΔI (1963-65)
U-I	-.47	-.12	.09	.09

The same is true for the departments of Tucumán:

ΔI / U - I (1960): -.73.

This saturation seems to have produced among the high Argentina provinces a high positive correlation between E-I and U-I : .77 (1960).

The existing computer program for the Latin American model (see P. Burger, The Method of Simulation : Basic Concepts and Application, Bulletin des Soziologischen Institutes der Universität Zürich,5, 1967 pp. 48) reproduces the model mentioned above and also the mechanisms of the first phase (T-ES/ΔI: -). However, it does not include the specific problems concerned with U-I and the saturation of U. None-the-less, the output reflects the general trend as expressed by the sequence of contexts if the three intermediate contexts are represented by the mean values of T-ES/ΔI and T/ΔI (see p.41).

A N N E X

Matrices for the Latin American countries without Venezuela calculated by Roberto Gutman:

1) Matrix for all Latin American countries

2) Matrix for the low Latin American countries

3) Matrix for the high Latin American countries

Latin American Countries without Venezuela

	E	U	I	ES	E-I	U-I	ES-I	T	A	T-ES	ΔI 1945-59	ΔI 1954-59	ΔI 1960-65	ΔI 1963-65	ΔE	ΔU
E																
U	87															
I	80	75														
ES	92	86	85													
E-I	49	39	01	37												
U-I	25	48	-04	10	51											
ES-I	32	38	-08	48	72	37										
T	37	44	-05	25	86	84	64									
A	-54	-49	-55	-66	-71	01	-30	04								
T-ES	-05	0	-45	-25	62	70	24	73	32							
ΔI 1945-59	06	03	22	16	08	-33	-04	-12	-10	-31						
ΔI 1954-59	-22	-18	03	-19	-14	-26	-42	-15	07	03	19					
ΔI 1960-65	-	-	-	-	-	-	-	-	-	-	-	-				
ΔI 1963-65	-	-	-	-	-	-	-	-	-	-	-	-	-			
ΔE	-63	-56	-34	-49	-37	-57	-35	-55	16	-26	38	53	-	-		
ΔU	75	64	63	79	37	-03	15	17	-44	-19	13	11	-	-	-47	

Low Latin American Countries

	E	U	I	ES	E-I	U-I	ES-I	T	A	T-ES	ΔI 1945-59	ΔI 1954-59	ΔI 1960-65	ΔI 1963-65	ΔE	ΔU
E																
U	53															
I	20	-23														
ES	80	48	25													
E-I	83	84	-20	65												
U-I	39	84	-57	39	75											
ES-I	48	72	-50	60	77	85										
T	62	89	-33	70	88	92	92									
A	-17	0	-03	-30	-02	-02	02	-42								
T-ES	53	37	-50	47	83	90	82	89	0							
ΔI 1945-59	30	02	73	26	-09	-28	-33	-20	-08	-35						
ΔI 1954-59	24	-08	50	16	08	-39	-31	-14	-51	-22	13					
ΔI 1960-65	05	02	80	25	-17	-33	-37	-17	-08	-42	59	11				
ΔI 1963-65	25	-07	70	18	-02	-34	-42	-18	-37	-47	43	43	75			
ΔE	-50	-40	48	-67	-57	-50	-57	-64	64	-71	07	-15	50	47		
ΔU	79	30	27	76	64	09	36	44	-79	36	10	58	-11	04	-54	

High Latin American Countries

	E	U	I	ES	E-I	U-I	ES-I	T	A	T-ES	ΔI 1945-59	ΔI 1954-59	ΔI 1960-65	ΔI 1963-65	ΔE	ΔU
E																
U	77															
I	82	78														
ES	84	62	67													
E-I	24	10	-19	20												
U-I	42	64	36	01	35											
ES-I	31	26	-07	53	64	10										
T	25	30	-05	-02	81	79	48									
A	-37	-45	-35	-68	04	31	-22	37								
T-ES	-07	03	-26	-38	67	58	-05	75	35							
ΔI 1945-59	-77	-78	-82	-49	01	-47	15	-09	32	-10						
ΔI 1954-59	-85	-59	-58	-86	-32	-12	-48	-18	53	19	46					
ΔI 1960-65	-30	-06	-10	-37	-15	09	-38	-11	25	20	-12	75				
ΔI 1963-65	17	34	31	15	-35	09	-28	-30	-23	-13	-47	28	76			
ΔE	-85	-72	-65	-51	-37	-58	-27	-47	14	-23	79	71	23	-18		
ΔU	30	24	02	44	17	-11	41	-03	-31	-11	-27	-17	35	63	-48	